

"It is remarkable what a value is still put upon wood even in this age and in this new Country — a value more permanent and universal than that of gold."

HENRY DAVID THOREAU

Wood, as Thoreau recognized, has few equals among the many natural resources which contributed to America's growth. Abundant, accessible, and versatile, wood was a key element in the development of colonial America, and to this day contributes greatly to our economic vitality. Whether as a towering 90-foot mast on an early clipper ship, or in providing microscopic trace elements needed in a complex manufacturing process, wood has been with us at every step in our development. Wood is so old — and yet so adaptable that we continually find new uses for its many qualities.

Even before the arrival of the first Europeans, American Indians understood wood's remarkable versatility, making canoes from the bark of the paper birch, using young hardwoods to support teepees, shaping pails and buckets from maple burls, and creating powerful bows from forest saplings and arrow shafts from softwoods.

From the time of the Jamestown settlement, when the dense eastern forests were first cleared to make room for homesteads, the trees that fell before the axe found their way into fireplaces in winter, and into everything from tool handles to homes, from fences to butter churns. Throughout the early years, wood from the forests filled virtually all of the colonists' basic needs.

While early settlers were building and furnishing their homes from the forests, others were finding that trees supplied the raw material for basic industry. Pitch pines

and other softwoods could be tapped for their sap, from which sealants were made or turpentine distilled. By burning them under controlled conditions and processing the ashes, softwoods were also used to make potash, an alkaline compound indispensable in the manufacture of glass and soap. Chips from oaks and hemlocks were combined in water to make tannin, an essential ingredient for preserving hides.

New England white pines, as tall as 200 feet with trunks nine feet across, provided masts for sea-going ships. (At the time of the American Revolution, fully one-third of the British navy was American-built, explaining in part why England was so concerned about the independent leanings of its colonial citizens.) In fact, America's lush forests were the source of much of the raw material for the mighty navies of the 18th century: pine tar covered the rigging ropes to retard rotting; pine pitch sealed the caulking material in the hulls; and varnish from resins protected the ship's timber above the water line. Hardwoods and softwoods alike contributed to the shipbuilding industry. Besides the white pine mast, a shipbuilder might use live oak for the hull support braces; white oak for the rudders, keels, and planking; spruce in the spars; locust or hickory for the treenails; and perhaps teak or mahogany for the cabins and deckhouses. Navies were floating forests.

Other forms of transportation in the fledgling country relied equally as much on wood products. The canals

Products from the Forest



which enabled supplies to reach the hinterlands were built with sturdy wooden locks, and traversed by wooden canal boats. Carriages were made of native woods, as were farmers' carts and winter sleighs. Bridges spanning the numerous creeks and streams were of wood, and even the roads themselves were often paved with wood planking or logs to make them passable during the muddy spring season.

As the railroads expanded westward in the 19th century, wood fibers were found to be commercially useful in making paper. No longer forced to rely on scarce and expensive rags for papermaking, manufacturers using wood fiber began producing great quantities of paper at reasonable cost. In early 1870, newspapers were generally four pages long and cost five or ten cents; by the end of the decade, many newspapers had doubled in size and sold for only one or two cents. Books, too, dropped sharply in price, giving great numbers of people their first exposure to inexpensive reading matter.

As the pace of technological change has increased, so has the adaptability of wood. When more durable glues were derived from synthetic resins early in this century, plywood made from wood veneers moved from the interior, where it had been used for furniture, to the exterior, where it is used extensively in homebuilding. More recent advances in adhesive technologies have resulted in chipboard and particleboard, which use virtually all of the tree. In fact, within the past several years, a laminated wood baseball bat has been developed which can

withstand those 90 mile-per-hour fastballs with the same aplomb as solid ash.

As more complex processes were used to process wood, chemists came to realize that in many cases wood by-products were themselves valuable. Up to half a tree may be lignin, a complex natural chemical that binds the fibers together. Lignosulfates removed during the paper pulping process are used in the manufacture of cleaning compounds, ceramics, artificial vanilla flavoring, and laundry anti-cling agents. Ethyl cellulose and other chemical-based cellulose are used in making photographic films, sausage casings, electrical tape, and a host of other products. Acetate filament yarns, also derived from cellulose, include rayon fiber and other textile products.

Although technology has broadened the uses of wood, it remains today as popular as ever in some of its original forms. Wooden tool handles, finely-crafted tables and chairs, and home-framing lumber are all as much in demand today as two or three centuries ago. As recently as the 1970's, 215 million board feet of lumber were used in barrel making, mostly for wine and whiskey vats. And in 1984, over 21 million new wooden railroad ties were laid in the United States.

What will the future bring? As technology progresses, more uses for wood will undoubtedly be found. Wood will continue to produce products in abundance for consumers and industry alike. Thoreau's comment is as valid today as it was a century and a half ago — wood has a "value more permanent and universal than that of gold."

18th Century

axe handles
stirring spoons
pulley wheels
resins for ship sealants and
rope preservatives
firewood
spools
roofing shingles
plates
potash
tannin for curing hides
rocking chairs
barrel staves
aspirin
chessboards and figures
ship masts
Christmas trees
beanpoles
picket fences

cedar chests
corduroy roads
log cabins
broom sticks
canoe ribs
charcoal

19th Century

telegraph poles
newsprint
railroad ties
Connestoga wagons
turpentine
matches
sleds
rabbit hutches
rulers
locomotive fuel
coal bins
pencils

grocery bags
baseball bats
Mississippi steamers
lobster traps
dominoes
rowboat oars
gingerbread scrollwork
sarsaparilla soda
tall oil
postcards

20th Century

computer paper
detective novels
chipboard
redwood decking
plywood
coffee filters
Scrabble tiles
melamine resins
hat check stubs
soil conditioners
kitchen countertops
toothpicks
biomass fuel
sludge dispersants
tempering oils
Jimi Hendrix posters
citrus oils, mints, other
assorted fragrances

Torula Yeast

*made from wood sugars
recovered during the pulping
process and used in:*
baby foods
imitation bacon
vegetarian foods
baked goods
beverages

Cellulose

*cellulose fiber filler or cellulose
acetate is used in:*
urethanes
acetates

rayon
plastic packaging
floor tiles
sanding sealers
pressure sensitive adhesives
carpeting and upholstery
backsides
screwdriver and other tool
handles
football helmets and hardhats
dentifrices
carbon papers
flash cube coverings
irrigation system piping
plastic twines
computer casings
molded luggage
placemats
sandwich bags

Lignosulfates

*from spent sulfite pulping liquor is
used in:*

cleaning compounds
ceramics
pharmaceuticals
insecticides
hair spray
deoderants
fungicides
grouting
laundry stain remover
artificial vanilla flavoring

Bark

from which we obtain:

cork
shoe polish
cosmetics
plywood adhesives
poultry bedding
oil spill control agents

Wood alcohols

are used in the production of:

colognes
formaldehyde
solvents
ethyl alcohol

How Much Is A Cord?

Thousands of products used by Americans every day come from wood.

It takes land, air, water, sun, and time to grow the wood needed for these products. Then it takes technology to make the impressive quantities of things that can be made from a cord of wood today.

Different products require different kinds of trees, but, for general information, a cord of wood will yield the following quantities of products (one cord equals a pile of wood 4' x 4' x 8' — 80 cubic feet of wood):

7.5 million toothpicks or one ton of paper or 942 one pound books or 61,370 business envelopes or 4.3 million commemorative-size postage stamps or 460,000 personal checks or 89,870 sheets of letterhead bond paper or 1,200 copies of National Geographic or 2,700 copies of an average daily paper or 250 copies of the Sunday New York Times or 30 Boston rockers or 12 dining room tables.

Building an average 1800 square foot home uses 10,000 board feet of lumber — equivalent to 20 cords.

What Can You Do With Bark?

20 percent of a cord of wood may be bark. Bark, wastewood and pulping liquors provide more than half of the U.S. forest industry's energy needs. Bark is also a source of many chemicals and is used for mulches and soil conditioners. By-products from wood also end up as vitamins, plastics, explosives, photographic film, toothpaste, and pharmaceuticals, to name a few items.

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